



Association of Independent
Research & Technology Organisations

**AIRTO response to OST
consultation on research in
Europe after Framework 5**

AIRTO Paper 2000/4

AIRTO response to
OST consultation on research
In Europe after Framework 5

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August 2000

EXECUTIVE SUMMARY

This Policy Paper describes the AIRTO response to the EC Communication “Towards a European Research Area” and OST consultation on the composition of FP6.

The problem to be solved is to improve EU industrial and commercial competitiveness and to increase innovation intensity. Comparisons undertaken by the OECD, the European Commission and Member States all indicate that EU competitiveness must be improved if the aspirations for lifestyle of EU citizens are to be met. Also the EU has a low level of innovative intensity in new technology and new industry compared with the USA, Japan and the emerging high-tech industries of the Far East.

AIRTO supports the concept of EC Framework programmes. The problem is not the amount of public funds allocated to R&D in the EU. The problem lies in changing the culture and attitudes of industry towards innovation. A policy shift is needed to solve the problem of industry connectivity to implementing Framework project results. Present policies fail to grasp this problem. Later in this paper specific proposals will be made to change that situation by a radical modification to EC and Member State policy. That policy must focus on three issues. They are

- **creating a dynamic EU market**
- **focus to achieve critical mass in innovation**
- **institutional infrastructure – better project selection and management.**

Europe must improve its competitiveness, especially in new technologies which are knowledge-driven. Previous Framework Programmes, and related EC Programmes, have made a contribution to solving this problem but the time is now right for radical change in policy. That change must centre on:

- project connectivity to value-adding companies
- focus on, and critical mass in, key subject areas – using pan-European Foresight
- greater use of knowledge transfer organisations which link sources of innovation to commercial trading
- resolution of confusion in government policy concerning the role of academic research in innovation.

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Members of the AIRTO Working Party on the AIRTO response to OST consultation on research in Europe after Framework 5

Dr Brian Blunden OBE - President of AIRTO (Chairman of Working Party)
Professor Richard Brook - Chief Executive SIRA Group (Chairman of AIRTO)
Mr David Goodrich - Chairman BMT (Vice Chairman AIRTO)
Mr Roger Courtney – Special Projects Advisor BRE
Professor Colin Dennis - Director General CCFRA
Mr John Wilkinson - Co. Secretary/Finance Director CCFRA (Hon Treasurer & Co Sec AIRTO)
Dr Neil Sanderson - Chief Executive CERAM
Dr John White - Managing Director CRL
Dr Stuart Exell - Chief Executive EA Technology
Mr John Wood - Managing Director MIRA
Dr John Perkins - Chief Executive NCC
Dr Ron Whittaker - Chief Executive SATRA
Mr Bevan Braithwaite OBE - Chief Executive TWI

AIRTO response to OST consultation on research in Europe after Framework 5

1) Introduction

AIRTO has studied the European Commission Communication entitled "Towards a European Research Area" and the OST Consultation document which embraces the salient issues raised in the report of the UK Council for Science and Technology (CST). This response covers four topics as follows.

- Industrial competitiveness and the contribution of European Framework Research Programmes
- Views on the composition of FP6
- Views on the longer-term future of European collaborative research
- Response to specific OST questions

2) The problem: EU industrial competitiveness

The problem to be solved is to improve EU industrial and commercial competitiveness and to increase innovation intensity. Comparisons undertaken by the OECD, the European Commission and Member States all indicate that EU competitiveness must be improved if the aspirations for lifestyle of EU citizens are to be met. Also the EU has a low level of innovative intensity in new technology and new industry compared with the USA, Japan and the emerging high-tech industries of the Far East.

AIRTO supports the concept of EC Framework programmes. The problem is not the amount of public funds allocated to R&D in the EU. The problem lies in changing the culture and attitudes of industry towards innovation. A policy shift is needed to solve the problem of industry connectivity to implementing Framework project results. Present policies fail to grasp this problem. Later in this paper specific proposals will be made to change that situation by a radical modification to EC and Member State policy. That policy must focus on three issues. They are

- **creating a dynamic EU market**
- **focus to achieve critical mass in innovation**
- **institutional infrastructure – better project selection and management.**

Europe must improve its competitiveness, especially in new technologies which are knowledge-driven. Previous Framework Programmes, and related EC Programmes, have made a contribution to solving this problem but the time is now right for radical change in policy. That change must centre on:

- research project connectivity to value-adding companies
- focus on, and critical mass in, key subject areas – using pan-European Foresight
- greater use of knowledge transfer organisations which link sources of innovation to commercial trading
- resolution of confusion in government policy concerning the role of academic research in innovation.

2.1 Research connectivity to value-added trading

Member States governments, the European Commission, universities and public research centres do not create wealth. However, Member States governments and the European Commission can influence the wealth creation process through policy and fiscal measures which stimulate innovative enterprise. Universities contribute to wealth creation through the quality, motivation and competences of their graduates. In addition, the university environment is one in which fundamental research is justified. When such research is directed to address relevant (Foresight) agendas, it can lead to subsequent value-adding processes. This is the unique contribution of academic research to improved competitiveness but it demands a “third party” transfer infrastructure.

EC Framework Programmes have often had characteristics similar to undirected curiosity-driven research. Although Framework programmes were intended to be applied research, they have not been adequately connected to an on-going process of value-added trading and wealth creation. This lack of connectivity has been the weakness of EC research expenditure. The EC Audit function would do well to re-direct its attention to this major issue of value rather than placing emphasis on contractors charge rates. Framework Programmes have not created partnerships on the scale needed nor have they made adequate contribution to a dynamic market infrastructure for competitive business in the EU.

Another influence on EC programmes which requires examination is the demand made on research projects by Community Policies, eg health, transport, environment etc. While it is proper for these policies to be supported by research, that must not be at the expense of value-added innovation in industry or industry partnership programmes intended as a strategic focus for improved competitiveness. Where the EC requires research to support Community Policies, it should purchase such research on a fully funded contract basis. The EC should operate a system of fully funded “customer – contractor” arrangements where it needs research inputs to support policy implementation.

These arguments suggest new criteria are needed to justify EC Framework research support. Unless new criteria are introduced, the EC will dissipate taxpayers investment without making significant contribution to EU competitiveness. Future EC Framework research funding should be granted only if proposals conform to the following new and existing criteria:

- Participation of a project co-ordinator or partner with a track record capability to manage the results along a route to market or
- a participating partner who provides a contractual undertaking to finance the taking of results to market, subject to achievement of the project's success criteria.
- Identification at the time of submission of investment criteria acceptable to venture capital or similar investment partners.
- Independent authoritative authentication that the project topic is one of significance in global markets (Foresight).
- Evidence which demonstrates how the project will contribute to EU competitiveness and job creation.
- Evidence of how the project, if successful, will enhance an existing EU supply chain or create a new EU supply chain.
- Evidence that the proposing partners have project management, business development and market development skills which will result in application of output to creating a dynamic EU market infrastructure.

3) Focus and critical mass in key subject areas

To change the competitiveness of companies in the EU will require critical mass in R&D and increased innovation intensity. This can be achieved only by a multiplier effect which amplifies EC funding, because total Framework funding is less than that of many large companies expenditure on R&D. Critical mass will be achieved only if future programmes are focused on a limited number of topics and are embedded in the business activities of either new investors or existing commercial organisations. Critical mass demands focus in topic selection.

Focus implies challenge in determining topics for support. Member States vary in their attitude towards "picking winners". Civil servants cannot be expected to make such judgements. The use of so-called "expert panels" are often dubious in competence. There is a better solution.

In most Member States there exist three resources which could contribute to objective selection of priority topics in Framework Programmes to improve focus. The resources available are:

- Foresight communities

- independent research and technology companies (including techno-management consultants)
- venture capital and investment communities.

All three communities (Foresight community, research and technology companies and venture capitalists/investors) are independent of government. In addition, the credibility of these organisations depend on the reliability and quality of advice they contribute in decision-making for their clients. Their competence is subject to a market test.

Therefore, Europe has private sector competences to select better key research topics and to integrate public support with commercial value-added supply chains. The “EU Foresight community”, the competences to be found in AIRTO (UK), Fraunhofer Gesellschaft (Germany), TNO (The Netherlands) and similar organisations are assets which must be used more effectively as a source of independent research direction. Similarly, Europe has expertise in investment through such organisations as the European Venture Capital Association (EVCA). The need is to bring these elements together by institutional infrastructure. It is an essential “systems” function of Framework Programmes.

The EC rôle is to bring these resources together and to make public investment in them, to provide an integrated mechanism for enhanced focus, project selection and evaluation in EC Framework programmes. The recently established dialogue between AIRTO, the Fraunhofer Gesellschaft and TNO should be used to develop proposals for the creation of new mechanisms. To improve the present situation, a new approach is needed. Such an approach to EU research direction should adopt the following first steps:

- Introduce (during the period covered by FP5 under the Horizontal Programme – Introduction to the Role of Community Research) a support measure to bring together existing Foresight Programmes in the EU to create a synthesis from which to develop an EU vision for industry, E-commerce, wealth creation, job creation and competitiveness improvement and pan-European issues, eg collaborative medical health research.
- The above synthesis to be tested through debate with the heads of leading EU companies in a “Davos style” dialogue, mediated by the contract research and investment community.
- The validation process of key areas for future support, developed through dialogue with industry leaders, to be managed by EU knowledge transfer companies (AIRTO, Fraunhofer, TNO etc). These independent Member State organisations to work with leading European business schools and international technology consultancies (Andersen Consulting, CAP Gemini Consulting, PricewaterhouseCoopers Consulting etc) to provide the range of

independent competencies needed to guide Member States and the EC in the application of pump priming funds linked to a multiplier effect through integration of the programmes with EU industry to change the innovative dynamic of the EU marketplace.

For such a mechanism to be put in place, action is needed immediately under FP5, utilising the funding resources available under Horizontal and Support Programmes. Such initiative would provide the professional underpinning which FP6 must have to achieve competitiveness enhancement in the EU.

4) Academic research in universities

Europe has many high quality universities. These universities are essential for the commercial and cultural development of the EU. The most important contributions which universities make to Framework Programmes are:

- a continuous flow of high-calibre graduates
- the pursuit of directed fundamental research on topics relevant to wealth creation in the EU.

It is essential in all Member States that high-quality universities be funded properly to achieve the two above stated output objectives. However, not all universities will be capable of sustained high-calibre fundamental research. In addition, it will be ever more essential to link centres of academic excellence throughout the EU. When such linkage is properly directed and co-ordinated, it will have a multiplier effect on resources by increasing critical mass in chosen fundamental knowledge areas and provide essential input to knowledge transfer processes to EU companies. Partnership must be encouraged between universities, knowledge transfer companies and industry. It is the needed pattern for a new and dynamic marketplace.

Funding universities is primarily the responsibility of Member States, not the European Commission. Universities should be encouraged to participate in Framework Programmes in two specific modes.

The first mode of universities participation in Framework programmes should either be as a sub-contractor to a commercial partner or an applied research organisation, such as AIRTO members (sometimes acting through a Faraday Partnership) or Fraunhofer Institutes. This will ensure that the university contribution – which should be at a fundamental research level – will be transformed into a practical application with a route to value-adding in the marketplace. The value of university IPR should be fully recognised and financially rewarded in such arrangements.

The second mode of university participation in Framework programmes should be through allocation of funds to encourage networking. EU universities should be rewarded for creating distributed (virtual) research areas essential to the development of EU competitiveness and the new technology marketplace. Funds should be provided to collaborating universities to enable them to integrate their work programmes. They should be encouraged to create critical mass in selected areas and to transfer fundamental new knowledge to the marketplace through partnership with knowledge transfer companies.

There are already examples of EU university collaboration. This activity should be stimulated. In the age of virtual organisations such research collaboration among EU universities should replace the concept of “fixed site” Joint Research Centres (JRCs) as funded currently by the EC. Such a change in policy would be cost-effective. It would stimulate Europe’s academic community and would increase flexibility by changing the focus of such research according to demand patterns. Also such a mechanism would contribute socially by increasing awareness of EU identity in science and technology. It would raise the influence of European scientists and engineers in the world academic research community.

Annexe B - Response to OST questionnaire on the content of FP6

1) What practical benefits has Framework produced for you or your organisation and how could they have been increased?

Response.

Framework programmes have produced benefits to AIRTO members. At the simplistic level, the benefit is derived by an AIRTO company acting as a partner to gain financial support for research to maintain core skills no longer funded by the DTI. However, the complexity of the bureaucratic proposal procedures and delay in payment combined with low percentage contribution, can make the Framework programme of marginal business relevance to an AIRTO member. Nevertheless, it is the only source of funds available to support applied research competences in the UK. Thus it is essential and must continue to be supported by the UK.

More importantly, AIRTO members’ mission is to catalyse support to companies which leverages the contribution to competitiveness. AIRTO members, similar to Fraunhofer and TNO, act as the agents of companies to engage in collaborative European R&D to enhance their businesses. Unfortunately, the prescriptive nature of Framework programmes, coupled with no UK government recognition of the role of knowledge transfer companies, reduces this benefit. If there were no Framework programme, AIRTO members would suffer loss of the only remaining support to industry collaborative research. Also the Framework Programmes have stimulated

EU business partnerships and provided models for EU-wide contractual business relationships. These are significant infrastructural benefits. The demise of Framework programmes would be to the detriment of UK industry but there is a strong case for revision of Framework management. The benefits could be increased by radical change in Framework objectives. This change must be implemented in FP6.

2) Do you agree with the objectives of FP6 outlined in Annexe A, paragraph 5?

Response.

AIRTO supports the following objectives for FP6, selected from the OST list.

Must contribute more than the sum of its national parts.

Robust procedures must be in place for evaluation and monitoring.

Drive industrial competitiveness and innovation.

Greater focus.

Future funding should focus on areas where the scale of the research requires co-operation at EU level.

Dissemination and exploitation of the results of community research must be improved. (This requires a radical change in policy and attitude as described in this paper whereby all projects must be related to commercial organisations capable of market implementation.)

The main vehicle for European activity should be co-ordination.

Open competition using tried and proven methods of testing for value and quality in the acquisition of scientific services.

European research should be outward looking; FP6 needs to encourage collaboration with top research communities outside Europe and attract the best brains into Europe.

Response: AIRTO disagrees with the following objectives for FP6, selected from the OST list.

Community Programmes (including Framework) should be driven by the needs of community policies. AIRTO believes the primary driver should be competitiveness and job creation. Community Policy should be a secondary driver. Community Policy research should be funded separately at 100% on a customer/contractor basis. Dissemination is the wrong concept for Framework research. Projects should be integrated with organisations capable of commercial exploitation at the outset of proposal acceptance. The whole concept of dissemination smacks of academic research publishing. That concept is irrelevant at the EU Framework level.

Supporting the development of other policies covered by the Treaty (health, environment, transport, international development, agriculture, fisheries etc.) should be dealt with as specific Member State collaborative funding issues and not interfere with the use of Framework programmes to create new value-added business in the EU to ensure competitive survival. The Framework should not be policy driven, if this means that Directorates-General are the customers. The customers for Framework 6 must be EU industry and commerce. Directorates-General are incapable of fulfilling this role. They may act as management agents but they will require to use competent third parties to interface with industry for purposes of defining customer need. Those third parties have been described in this paper eg AIRTO, Fraunhofer, TNO, international technology consultancies and top-ranked European business schools. Joint Research Centres should be made to justify their existence by exposing them to market forces. They should be notified of this intention not to provide any funding to them unless it is by open competition for specific projects required by the EC. A new approach to Joint Research Centre concepts must be introduced by exploiting the idea of virtual networking among existing resource organisations throughout the EU. The intention should be to progressively eliminate the present concept of JRCs, with some notable exceptions such as CERN.

- 3) FP5 comprises two distinct types of programme: those based on scientific themes designed to address particular social and economic problems (eg Quality of Life) and those which provide cross-cutting support activities (eg researcher mobility). Should this current basic structure be retained?**

Response

The focus of FP6 should be exclusively on enhancement of the competitiveness of EU industry and the creation of new industries. Attempts to include a multiplicity of objectives will weaken the focus and prevent the creation of adequate critical mass to enhance competitiveness and job creation in the EU. Where the EC require research on social and economic problems, it should fund these additionally and do so at a fully funded rate on a customer/contractor basis.

- 4) Scientific content:**
- (a) What would you keep and what would you cut from FP5?**
 - (b) Which new topic should the UK propose for Framework 6 and what are the priorities in your area?**

Response.

This paper advocates a more professional approach to Foresight, and its co-ordination throughout the EU, combined with the use of competent agencies to

develop prioritisation for FP6. The priorities selected for FP5 are not unreasonable insofar as communications, biotech and environmental engineering etc will remain important areas for global development for the foreseeable future. The task now is to prepare for two new mechanisms, whereby the Framework 6 Programme will provide European co-ordination and contribution which attracts a multiplier effect from industry to create significant new business activity in the EU. That will be achieved by the following.

- The use of appropriate third parties to co-ordinate EU Foresight activity to create an agenda of opportunity (that is distinctly different from a prescriptive project agenda).
- Implementation (under FP5) of dialogue (managed by independent expert third parties) with industry leaders to determine areas in which the EU is likely to have the need for, and the will to act in, co-ordinated partnership to produce world-beating industry sectors, eg aerospace, mobile communications, biotech etc.

Member State programmes should not be seen as in conflict with, or an alternative to, Framework programmes. Instead the role of the EU (and its commissioned expert resources) should be to harmonise EU-wide activity with Member States' commercial organisations to achieve critical mass capable of dominating world markets. In this role Member State procurement programmes should be seen as part of the funding mechanism to produce additional finance for innovation and should be co-ordinated with Framework funding. A good example would be co-ordination of EU medical and health R&D.

5) Have you concrete suggestions for improving FP management, including the simplification and acceleration of procedures where appropriate?

Response.

The present procedures (applications, approval and payment) are disastrously slow. As a result many leading organisations in the EU do not bother to participate. Thus there is inefficient use of taxpayers' investment funds, which could be more effectively employed. The key to improving the system is as follows.

- There should be no prescription on topics but instead a Foresight style agenda of opportunity.
- Application should be in two phases; the first a minimal statement of project proposal objectives and benefits, followed by a second more detailed application based around the concepts used by the venture capital industry to test validity.
- The process of evaluation for project proposals should be sub-contracted to competent third party organisations on a fixed cost basis per application; there should be a delay penalty clause built into such contracting which would ensure rapid proposal processing.

- Contract negotiation should be outsourced to competent third parties using standard procedures.
- Transfer to market of results should be a primary aspect of proposal approval; proposals must be linked to, and contractually backed by, an organisation with adequate resources to take the output from the project into market application—subject to the achievement of the success criteria in the project as stated at its proposal stage.
- Contract payment by the Commission should be subject to a strict timetable with severe retribution clauses against the Commission if failure to pay on time is encountered, the role of the financial audit function requires investigation to prevent it being an unjustified impediment to business development.
- The funding rates should be flexible to allow purchasing of quality resources.

The key to management of the Framework programme is to outsource it to professionals and not to run the programme via bureaucratic processes. The so-called cost control and audit functions need investigation to bring them into line with commercial practice.

6) Monitoring, evaluation and impact assessment in FP6: What features would you like to see and how can we ensure effective follow-up action?

Response.

The key answer to this question relates to impact assessment. The purpose of the Framework programme is to improve competitiveness in the EU and to stimulate new innovative businesses, which create jobs and increase the wealth of EU citizens. Too many projects in previous Framework programmes have been “nice to know” and have not been converted into value-added business. They respond to bureaucracy instead of focusing on market needs. This paper advocates that project evaluation should focus primarily on the linkage of the proposal to organisations capable of carrying the output into real value-added business. It is in this area where radical change is required. The present evaluation procedures using a dubious mix of persons at non-commercial rates should be replaced by evaluation undertaken by professional organisations in return for payment in keeping with market rates.

If the programme cannot justify this investment, it cannot claim to be a serious contributor to EU market development. This refusal to pay market rates for professional work is a major failure in the cost control and audit function.

7) How should the links between the Framework Programme and other European mechanisms for RTD co-operation e.g. EUREKA and COST be developed?

Response.

This question is at the centre of the AIRTO response. The primary role of the EC is in co-ordination of research which requires a multi-Member State collaboration to achieve critical mass to stimulate competitiveness in global trading. Thus Framework programmes and other programmes such as EUREKA and COST should be perceived as a single strategic entity. The only differentiation of significance in the characteristics in all programmes should be their topic focus and their relationship to SMEs versus their relationship to larger players. Both large companies and SMEs must be engaged in these programmes.

SMEs require minimum bureaucracy for support with non-repayable loan facilities in order to develop their proposals at a pre-funding stage. Present proposal and cost control procedures are disaster areas for SMEs. The Commission can play a valuable role in support mechanisms. When dealing with larger enterprises the objective must be to increase the global market dominance of significant EU supply chain companies. That requires a different approach to the conditions for funding SMEs.

Annex C Questionnaire on the long-term future of European collaborative research

Essential questions

1) What do you see as the fundamental purpose(s) of collaborative research at a European level? Do you support this objective?

Response.

AIRTO supports collaborative research at a European level. It is the only way to achieve the critical mass necessary to achieve major competitive sectors able to win significant shares of, or dominate, global markets. This means, EU collaborative research must be linked to players able to operate in this fashion and the work must be pan-European to gain the scale necessary to be a player in world markets. Collaborative research at EU level should be a prime driver of the Single Market. The EC rôle is to stimulate private sector initiatives and co-operation. The EC rôle is not to introduce intervention or more bureaucracy.

2) Is there a need for a Framework programme? If so, what should its objectives be?

Response.

There is need for a Framework programme. Its purpose should be primarily that of focus and co-ordination to achieve a scale of effort in the EU which will change the industrial manufacturing and commercial base of Europe. Too often the earlier Framework programmes have dealt with relatively unimportant issues and have been disconnected to the onward process of manufacturing or commerce. This must be changed. The Framework programme must have the strategic objective of building scientific, engineering and technology infrastructure in the EU private sectors.

3) Should current financial support mechanisms of Framework be replaced or complemented (across the board or in individual areas) by fundamentally different mechanisms for EU research support? If so, what structure should be adopted?

Response.

Present support mechanisms should be aligned to other private sector (investment) funding to achieve a multiplier effect on public investment. Unless this is made conditional, Framework programmes will not achieve the leverage which justifies the use of public funds. A distinction should be made between SMEs and larger enterprises. SMEs are often the source of innovative ideas. The innovation intensity of the EU needs increasing by stimulating innovative SMEs. This will be done only by professionally assessing proposals and then providing unconditional non-repayable loans to stimulate that portion of SME proposals which lead to serious business propositions which can then be integrated with Framework support to larger enterprises.

The management and policy direction of funding should be aligned to the principles which presently govern venture capital and other private sector investment funding mechanisms. It should be sub-contracted in its management to those competent to manage investment funding in high-risk areas, such management should be fully funded.

There should be separate funding for research which supports EU Policy issues. This should be fully (100%) funded contract research where the EC is the client and then operates a customer/contractor relationship with the supplier.

- 4) What fraction of R&D spending should it constitute? (Currently Framework expenditure represents 5% of the total public expenditure on R&D in the EU.)**

Response.

The present level of 5% is reasonable. However the critical issue is the degree of leverage which that 5% investment achieves. At present it is not achieving success in leverage. Therefore professional study is required to assess if the cause is due to methodology or due to the fact that this sum is inadequate to motivate leverage in the private sector.

- 5) How should it adapt to larger membership of the EU?**

Response.

AIRTO is not competent to judge this issue.

- 6) What treaty changes, if any, would be needed to bring about your proposed changes?**

Response.

AIRTO is not competent to judge this issue.

- 7) If there were no Framework Programmes and the notional UK contribution were available instead for domestic science and innovation purposes (say £400 million per annum) how would you like to see these funds spent?**

Response.

AIRTO would not advocate withdrawing UK support to EU Framework research. The EU Single Market is the “home“ market for the UK. The issue is not a withdrawal of public funds but how those public funds may be used to stimulate greater private sector investment in creating competitive new industry and commerce in the EU. It is in that subject area where the OST should focus its policy thinking and not in cost cutting approaches to the use of public funds.

It should be noted as a matter fact that the sum of £400 million per annum is the equivalent of what the German government allocates to the equivalent of AIRTO (Fraunhofer Gesellschaft) to stimulate collaborative research and innovation.

However, it does not prevent Germany being a major contributor to EU research funding. Why the UK does not adopt a similar dual approach, requires debate.

Another issue which OST and DTI should address is the question of Member State funding of applied collaborative research which amplifies and complements Framework Programmes. In this respect OST should re-examine the DTI Assessment Paper Number 32 "DTI Funded Research Projects at Research and Technology Organisations, Evaluation Report" May 1997.

Conclusion

AIRTO supports the concept of European-wide R&D Framework programmes. These should not be seen as a substitute for Member States Programmes. There should be co-ordination between the two activities but most important of all, there should be linkage with industry and commerce from the outset.

The AIRTO Board would welcome dialogue with OST to develop views on these issues. It should be noted also that following discussions between the President of AIRTO and the President of the Fraunhofer Gesellschaft (and in consultation with the UK Minister for Science), there is now the intention to co-ordinate AIRTO, Fraunhofer Gesellschaft, TNO and like organisations' contribution to applied research in the EU. AIRTO would welcome sharing these ideas with OST.

Description of AIRTO

AIRTO is a network of the United Kingdom's independent research and technology organisations and promotes their role in strengthening industrial performance through consultancy, design, information management, knowledge transfer, research and development, skills provision, technology transfer and training.

AIRTO members are quality- and value-adding companies with a track record of success in knowledge transfer. They are driven by the desire for customer satisfaction and profitable success in a competitive market place.

AIRTO provides a point of contact between UK independent research and technology companies and government agencies, industry bodies and the European Community. It co-ordinates the views of its members and, by representing these to industry and government it provides policy leadership in the knowledge trading sector.

With some fifty member companies having between them a total turnover approaching £1 billion, AIRTO embraces a major portion of the growing industrial R&D effort of the UK. Members' activities span a wide range of disciplines from life sciences to engineering. Their work includes consultancy, managed fundamental research, contract research, developing and designing innovative products or processes, instrumentation, testing and certification, programmes of best practice, and techno-economic consultancy. Most run comprehensive information services, conferences and seminars as part of the process for knowledge acquisition and dissemination. Many organise joint ventures including venture capital investment programmes. The majority trade in the global market place.

Recent AIRTO Policy Papers are listed below.

- 2000/3 Increasing UK innovation intensity and the solution to the problem of knowledge transfer to business enterprise
- 2000/2 AIRTO response to the DTI proposal for a network of regional centres for manufacturing excellence and productivity
- 2000/1 Summary of AIRTO recommendations for a Science and Innovation Policy
- 99/1 Encouraging people to collaborate to compete: Proposal for implementation of a Competitiveness White Paper vision – AIRTO VIRTUAL
- 98/1 The PTP Scheme Achievements, lessons and recommendation for its continuation
- 97/2 The role of the RTOs in cross sectoral technology transfer: building on the success of The Carrier Technology Programme
- 97/1 AIRTO contributions to Foresight, training, education & knowledge-transfer as presented to Mr John Battle, MP, Minister for Industry and Energy on 12 June 1997
- 96/3 Case for the continuation of the first five PTPs
- 96/2 Trading with SMEs: Improving their competitiveness
- 96/1 The role of the European Commission in funding research and technological development

List of Members

Advanced Manufacturing Technology Research Institute	AMTRI
Aircraft Research Association Ltd	ARA
The British Glass Manufacturers' Confederation	British Glass
BHR Group Ltd	BHR
BLC Leather Technology Centre	BLC
British Maritime Technology Ltd	BMT
Building Research Establishment	BRE
Brewing Research International	BRI
The Building Services Research & Information Association	BSRIA
British Textile Technology Group	BTTG
Campden & Chorleywood Food Research Association	CCFRA
British Ceramic Research Ltd	CERAM
Construction Industry Research & Information Association	CIRIA
The Central Laboratory of the Research Councils	CLRC
CRL – The Innovation Centre	CRL
Cambridge Refrigeration Technology	CRT
EA Technology Ltd	EA
ERA Technology Ltd	ERA
FIRA International Ltd	FIRA
HR Wallingford Group Ltd	HR
Inspectorate plc	Inspectorate
Leatherhead Food Research Association	LFRA
LGC	LGC
Materials Engineering Research Laboratory Ltd	MERL
The Motor Industry Research Association	MIRA
Mineral Industry Research Organisation	MIRO
The Motor Insurance Repair Research Centre	MIRRC
The National Computing Centre Ltd	NCC
National Physical Laboratory	NPL
Pera Group	PERA
Pira International	PIRA
The Post Office Research Group	The Post Office
The Paint Research Association	PRA
RAPRA Technology Ltd	RAPRA
SATRA Technology Centre	SATRA
The Steel Construction Institute	SCI
Sira Ltd	SIRA
Smith Institute	Smith Institute
The Sports Turf Research Institute	STRI
TNO BIBRA International Ltd	TNO BIBRA
TRADA Technology Ltd	TRADA
Transport Research Laboratory	TRL
TRW Technical Centre	TRW
TWI Limited	TWI

For further information please contact:

The Administrator

airto

Association of Independent
Research & Technology Organisations

PO Box 85
Leatherhead
Surrey KT22 7YG

Main Line: +44 (0) 1372 802260
Fax: +44 (0) 1372 360835
e-mail: airto@pira.co.uk